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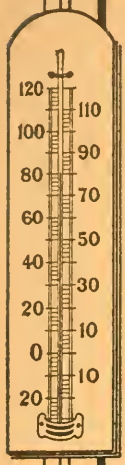

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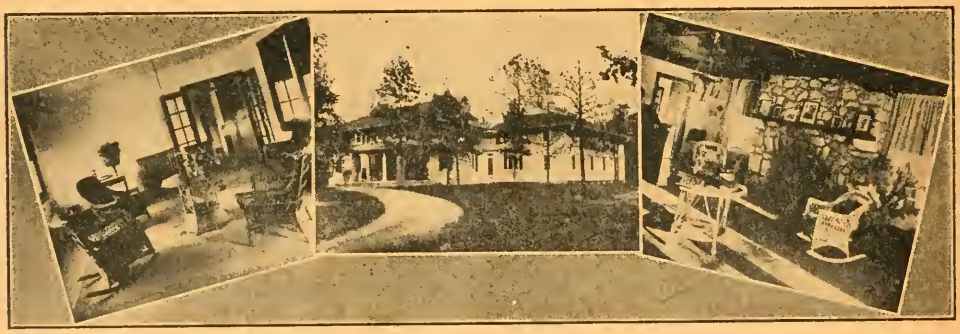

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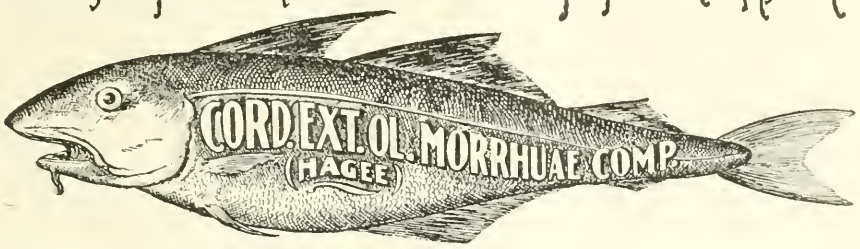

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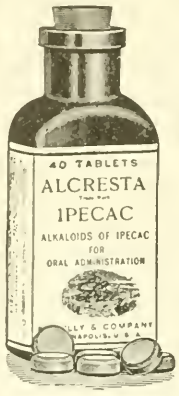

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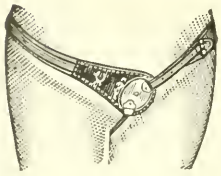

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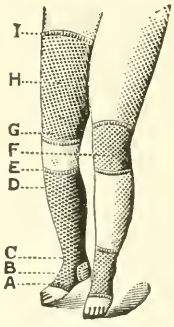

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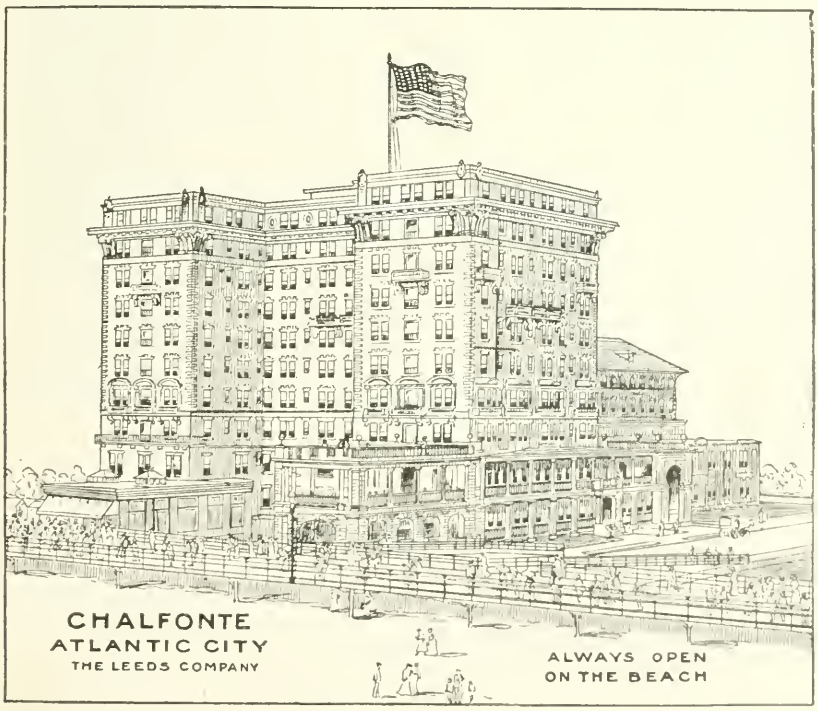

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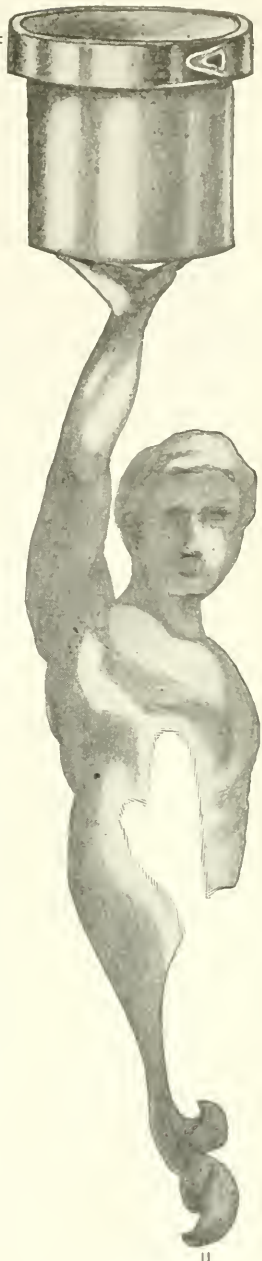

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A Handbook for Health Officers and Practitioners of Medicine

BY

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With an Introduction by J. N. HURTY, M.D., Health Commissioner of Indiana

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FRACTIONAL GASTRIC ANALYSIS AND GALL-STONE DISEASE.*

By Albert Hynson Carroll, M.D.,

Associate in Gastroenterology, University of Maryland.

THE constant efforts to discover new methods of diagnosis and to improve the old ones is nowhere more evident than in the field of gastroenterology. A field in which the objective and subjective symptomatology must always play the most important rôle, but in which we have come to depend largely upon information which can only be obtained from special methods. It is at once evident that these must measure up to a high standard, and to do this they must be founded upon an accurate knowledge and sound scientific principles. They must be practical and at least fairly constant in the results if these results are to form the basis for diagnostic conclusions. If a new or an old method which has been broadened and developed is to attain its full usefulness, more must not be claimed or be allowed to be claimed for it than is justified.

With the "single test-meal" as a basis, Rehfuss has developed the art of gastric analysis, and has given us the technique for "fractional gastric analysis." In view of the discoveries which have followed its use, we are now made aware of the inadequacy of the older procedure and of the practically negative value, from a diagnostic standpoint, which is afforded by the examination of single specimens of gastric contents. Much light is thrown upon the causes of a lack of definite relationship between the "test-meal findings" in the past and definite pathological gastric conditions. For the first time we have known what is *normal during the entire digestive cycle,* and we are now in a position to approach the study of the abnormal.† In the future we will base our conclu-

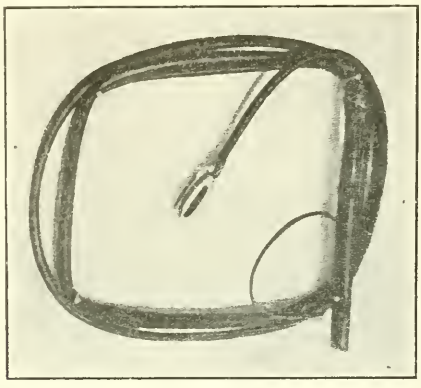
*Read at the annual meeting of the Medical and Chirurgical Faculty of Maryland, April 28, 1915.

†Martin E. Rehfuss, *Jour. A. M. A.*, Feb. 13, 1915: "Gastro-Intestinal Studies;" also *Amer. Jour. of Medical Sciences,* June, 1914.

sions upon the results obtained from investigations which have been scientifically conducted, and not, as in the past, upon a method which was incomplete and represented only what the functional activities of the stomach were at one period of the digestive cycle. With "fractional gastric analysis" the functional or enzymic capacities of the stomach can be traced from the first to the last stage of digestion.

METHOD.

The method consists of the withdrawal of test-meal specimens at regular and definite intervals after the meal has been ingested. The apparatus used consists of a modification of the Einhorn duodenal tube. It differs in as much as Rehfuss has designed a somewhat larger and heavier longitudinally-slotted bulb than the Einhorn tip, and the slender rubber tube is slightly greater in diameter. The added size of the bulb does not interfere with



THE REHFUSS TUBE FOR FRACTIONAL GASTRIC ANALYSIS.
(After Rehfuss.)

swallowing it, and the greater weight tends to keep it at the lowest portion of the stomach.

With this tube any portion or all of the gastric contents can be readily aspirated at any time. The tube does not cause inconvenience, and may be left in place for hours. When digestion is completed, or at any other time, the tip may be allowed to pass the pylorus and duodenal contents secured for study.

Upon examination of the specimens for free and total acid, blood, bile and character of food residue, a curve can readily be plotted which will graphically represent the digestive cycle under investigation. We have a picture which represents the functional activities of the stomach, which is just as luminous and full of surprises as are the X-ray serial or cinematographic pictures of the bismuth-laden stomach, as demonstrated by Lewis Gregory Cole. Cole gives us a picture of the *mechanics* of normal and pathological gastric conditions, while Rehfuss has furnished us the technique of a method for demonstrating the *functional* activities.

TECHNIQUE OF THE METHOD.

1. The patient is given a plate of well-boiled rice at 9 P. M. the night previous to the examination and what water he may wish at this time, but nothing more to eat or drink until the examination has begun.

2. At 9 A. M. the "bulb" is placed well back on the tongue and the patient directed to swallow it. There is seldom retching or coughing, events to be avoided because of the possibility of a return of neutralizing alkaline duodenal contents through the pylorus.

3. The gastric content is now aspirated and examined for acidity, blood, bile and starch particles. Iodine may be used to stain these and render them visible either to the eye or under the microscope. The bulk of the contents is noted also. This may vary normally from 20 to 100 c. c.

4. A definite amount of water is then given the patient to drink, and for the first 15 minutes specimens are aspirated each 5 minutes, and thereafter at 10 or 15-minute intervals until the stomach is empty or the acidity becomes constant. An acid curve is plotted from the findings in each specimen secured.

5. The tube is withdrawn and a small piece of toast and 10 or 12 ounces of tea are given. The tube is reintroduced and fractional specimens obtained, exactly as in the "water meal." These are studied for free and total acid, blood, bile, mucus and food residue. Again a curve is plotted, which should show also the time of appearance of pain, if such is the case, of the discovery of blood or bile, and of the disappearance of food from the stomach.

It is well to use only small specimens, and to titrate with 1/100 normal NaOH. Care must be used not to create a vacuum in the tube, as the suction may cause the appearance of blood from the mucosa. The patient will be more comfortable in bed, but the procedure may be carried on as well with the patient in a chair. Care must be taken not to allow too great a length of tube to enter the stomach, as in that case the bulb may pass into the duodenum. After each aspiration a little air may be passed into the tube to prevent contamination of the following specimen with contents of an earlier stage of digestion. The withdrawal is facilitated by telling the patient to swallow just as the tube tip is leaving the oesophagus.

Many discoveries have been made and reported by Bergeim, Hawk and Rehfuss regarding the normal secretions and the influence upon the gastric functioning by various stimulants. It may be well to mention a few of these:

First.—Water, when introduced into the stomach, is a great stimulant to secretion of gastric juices. It will cause as intense a flow as pure beef juice. A definite "water curve" for the individual can be recognized, and this is similar to a mixed-diet digestion curve.

Second.—The HCl content or percentage, in terms of 1/10 normal NaOH, is far higher than was formerly known.

Third.—When water is ingested during a meal, the first result is a dilution, with a lessened HCl percentage. This is almost immediately followed by an increased secretion of HCl. The water leaves the stomach almost at once, while the undigested food remains behind.

Fourth.—The high point in the HCl secretion in normal persons is usually found at the expiration of 60 minutes or thereabouts, but in pathological cases this may occur either many minutes before or long after the one-hour period.

(With these few observations in mind, the rational of the newer method of gastric content analysis will be emphasized, and the errors which are ever present in the "single test-meal" examinations are more clearly comprehended.)

Fifth.—All normal persons exhibit digestion curves which can be grouped into three great classes.

THE THREE GREAT NORMAL CLASSES.

Normal curves fall under the following three great headings: (1) The "Isosecretory," (2) the "Hyposecretory," (3) the "Hypersecretory."

The "isosecretory" type shows a steady rise to a high point of 60 degrees, in terms of 1/10 normal NaOH. It is usually sustained ½ to 1 hour, and then begins a gradual decline, with a total disappearance of food residue in 2 to 2½ hours. Its high point or "acme" is rounded; the curve is not broken.

The "hyposecretory" type is similar to the first, but there is usually a slower ascent, a slower response to stimuli, a high point of 40 to 50 degrees. Digestion is usually completed in 2 to 2½ hours.

The "hypersecretory" type shows a rapid response to stimuli, with a rapid change in acidity even in 5-minute samples. The high point is 70 degrees or over, either sustained or abrupt, and a slow decline or none at all in the usual time.

While there is a wide variation in the acidity exhibited in these three types, it is noted that there is little variation in motor power or tone. It is the established type which is the thing of importance, because deviations bespeak pathological conditions. These deviations may be in one or more of four ways, as follows:

(a) In the period of ascension. This usually occupies the first 30 minutes, and indicates response to stimuli.

(b) Alteration in the type or character of the "acme" or high point. This may be accelerated, retarded, abrupt or sustained.

(c) The period of descent or decline.

(d) The character and modifications of the food residues.

The "fractional" method will not solve all the riddles, but with it a more complete and scientific demonstration of what is normal has been made clear. It is first necessary to thoroughly comprehend and know these normal variations before a study is attempted

of the abnormal curves, an as yet practically unexplored field, full of interest and promise of reward.

Let us continue to remember that a definite stimulus produces practically always the same result under constant conditions, and that anatomic changes result almost always, although not invariably, in a change of function. Is it not, then, rational to conclude that, unless the gastric response did not in a way reflect the condition of this organ, it would be the first organ which does not follow known physiologic laws?*

Hence, within limits, there should be pathological curves which will serve as an index to certain conditions, and which we must learn to interpret. We will no longer be content with the findings from the examination of a test-meal which has been drawn at the one-hour interval. The "acid content" obtained in this way is of absolutely no value as an index to the gastric activities, either as to what may have gone on before or as to what is to follow. Or, again, to illustrate more graphically, let us suppose that in a given case the "acme" or high point of free HCl had been reached at 45 minutes, and at 50 minutes duodenal contents had returned into the stomach.

What would the result be? The "free HCl" would have been in part or in whole neutralized, and the report on the meal, drawn five minutes later, would probably be about as follows: "Free HCl absent; bile present, etc." Again: Bleeding may pass undiscovered, and will if it takes place at some period later than the aspiration of the one-hour meal specimen. I cite these merely as examples of the many sources of error to be encountered in the old method.

That there is a definite relationship between a high free HCl content and ulcer and a diminution or absence of "free HCl" in cancer there can be no doubt. But any definite relationship has never been established. It is only necessary to review the long lists of statistics, gathered from the clinics of many workers, to see that the "acid findings" in ulcer and cancer do not coincide with the definite conditions sufficiently often to furnish us with information of definite value.

It is not now difficult to see why this lack of uniformity has prevailed in the past, and that *in the future such statistics must be based upon "digestive curves," and not upon single-specimen examinations.*

I have introduced this method at the University Hospital, and although the number of cases investigated so far is not large, the value of the method is without question. The technique is not difficult to acquire, but a fair degree of patience is required. A fractional examination usually consumes from three to five hours, and this is perhaps the only drawback. With several assistants, and by grouping the patients, the labor is greatly lessened. However, this is distinctly a laboratory or hospital method, and cannot

*Being a review or digest. I have borrowed freely from the text.

be practiced except occasionally by the general practitioner. And it is somewhat like blood examination and similar work, which requires daily acquaintance with it to avoid becoming rusty.

Since the "fractional curve" is a record of the *functional capacities of the stomach,* and the X-rays series *is a shadow-picture of the mechanical aspect,* it is readily appreciated that the two studies should be co-ordinated if the best interpretation of the findings in each is to be had. That the method is a distinct step in advance is, I think, evident to all.

I wish to present, briefly, six cases. Three of these were gall-stone cases, one a "hookworm" case, one a post-cecal appendix, and the last an ulcer of the lesser curvature. The gall-stone cases had the diagnosis confirmed at operation. Fourteen living embryo were seen under the first cover-slip in the "hookworm" case. In the appendix case, the X-ray plates were strongly suggestive of obstruction at the pylorus, with symptoms of chronic ulcer. The X-ray pictures also misled in the ulcer case.

Fractional curves demonstrated that there was a continued hypersecretion in all three gall-stone cases. The curves were normal in the "hookworm" case and in the appendix case, while the "ulcer fractional curve" demonstrates how misleading a "one-hour-after" examination for free HCl would have been.

The cases will not be reviewed in detail, because of lack of time and space, but it may be mentioned that the three gall-stone cases were quite atypical in history and symptomatology; they were old chronic cases, and had been under all sorts of treatments for years. In two the symptoms pointed strongly to ulcer, while in the third the trouble was thought to be due to a visceroptosis.*

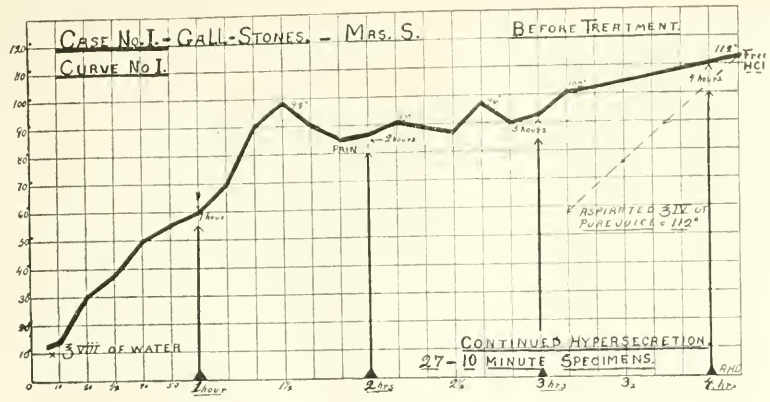
REPORT OF CASES.

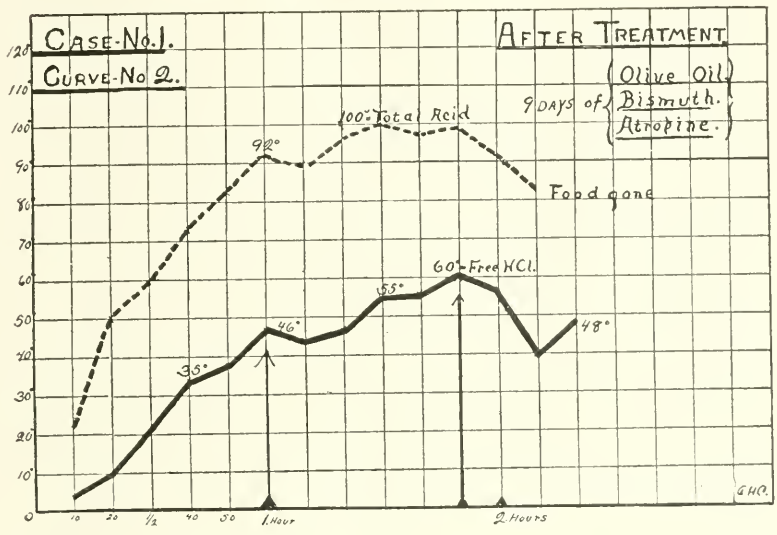
Case No. 1.—Mrs. S.; gall-stones. (Referred by Dr. Willse.)

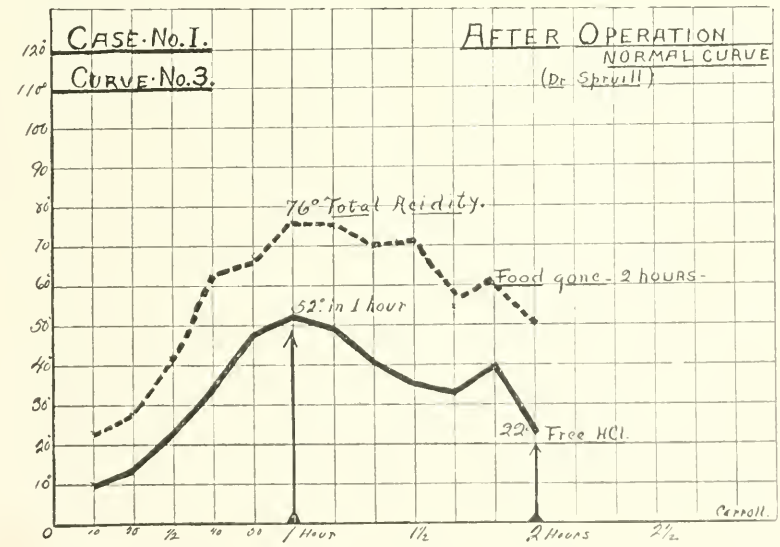
This patient exhibited symptoms which strongly suggested "ulcer," and with the exception that there was some tenderness in the region of the gall-bladder, there was nothing definite upon which to pin a diagnosis. The present attack was of four weeks' duration. She is a married white woman, 38 years old, and has had two children. She has never had typhoid, nor has she ever been jaundiced. This spell came on with pain in the epigastrium, with vomiting of a "greenish material," but no blood. Food relieved the pains for a time, but some pain was constantly present. Vomiting was persistent.

She was put on olive oil, bismuth and atropine after the first fractional analysis had been made, and the continued hypersecretion noticed in "Case No. 1, Curve No. 1." About nine days later the pain was much less, but had not disappeared, and the second fractional was made. I did this to see if the medical treatment

*The cases were operated upon for me by Drs. Randolph Winslow, Arthur Shipley, Robert Bay, Frank Martin and St. Clair Spruill. Dr. Maldeis examined the gall-stones bacteriologically, and Dr. Chandlee made all the X-ray photographs. I wish to thank these gentlemen for their interest and assistance in this rather tedious work.


CASE No. I. - GALL-STONES. - MAS. S.
CURVE No I.
BEFORE TREATMENT.
3VIII OF WATER
ASPIRATED 3IV OF PURE JUICE @ 112°
CONTINUED HYPERSECRETION
27 - 10 MINUTE SPECIMENS.
Free HCl
PAIN
1 Hour
2 Hours
3 Hours
4 Hours
1/2 Hour
2 1/2 Hours
3 1/2 Hours
4 Hours
GHD


CASE·No.1.
CURVE·No 2.
AFTER TREATMENT.
9 DAYS of { Olive Oil. Bismuth. Atropine.
100° Total Acid
92°
Food gone
60° Free HCl.
55°
46°
35°
48°
1 Hour
2 Hours
GHD.


CASE·No.I.
CURVE·No.3.
AFTER OPERATION
NORMAL CURVE
(Dr Spruill)
76° Total Acidity.
Food gone - 2 HOURS -
52° in 1 hour
22° Free HCl.
1 Hour
1 1/2
2 Hours
2 1/2
Carroll.

was inhibiting the formation of HCl. "Case No. 1, Curve No. 2." It was thought that her trouble was ulcer up to this time, but I discovered bile-stained flecks, containing red cells and pus cells in the gastric contents, and a much larger number in the duodenum after pressing upon the gall-bladder. X-ray pictures were ordered and taken. These demonstrated trouble, obstructive in character, near the pylorus and in the jejunum.

(Case No. 1. Plates Nos. 1, 2, 3, and 4.) The plates were so unusual that they are presented. It would have been indeed hard to make a more exact diagnosis than "adhesions" from them. The third fractional curve was made four weeks after operation by Dr. Spruill, who released two distinct bands of adhesions and removed 24 small stones from an inflamed gall-bladder.

The first fractional curve demonstrates a continued hyperchlorhydria lasting for more than four hours, with a high point of 112 degrees free HCl. With pain two hours after eating. The second curve shows not so much a diminution of acid present, but that the oil and bismuth had lessened the "free acid" content. The third curve, made after the operation, shows a perfectly normal type of curve of the "isosecretory" group. Compare this "hyperchlorhydria" and "continued hypersecretion" curve (Case No. 1, Curve No. 1) with the curves in cases Nos. 2 and 3. It will be seen that the three curves present a striking similarity in these three gall-stone cases. The continued "hyperchlorhydria" is the result of reflex irritation, due to gall-stones and adhesions. It appears that we may have established a curve which will represent this condition. Again, it may be only a coincidence and based upon too small a number of cases, and may be found to exist in a number of irritative states.

Study of Fractional Curves in Case No. 1.—On a fasting stomach 8 ounces of "tap-water" was given and specimens secured at 5, 10 and 20 minutes afterwards. Then for the remaining period specimens were aspirated every 10 minutes for four hours. At the end of this time there was aspirated 4 ounces of gastric juice of high acidity.—112 degrees free HCl. The entire amount which was aspirated was greater than double the amount ingested.

Pain appeared near the end of the second hour. Note that at *one hour,* the usual time of withdrawing a test-meal, the acidity was 60 degrees; at *two hours,* 88 degrees, and that from then on there was a continued rise. Grumous, pus-laden, bile-stained flecks were obtained from time to time.

The "rise" is slow, but regular. The "acme" is not acute. There is no decline in the curve if we call the 1½-hour point the "acme."

Curve No. 2 of this case was made after treatment directed to the lessening of the HCl secretion. Olive oil, bismuth and atropine were agents used. Ten-minute samples were secured, filtered and examined after a "tea and toast meal." Note that the

"free" and "total acid" is much diminished. Food gone in about two hours, but bismuth continued.

The "acme" is delayed until two hours have passed. It is but 60 degree free HCl, against 112 degrees in the first examination.

Curve No. 3.—This represents a typical "isosecretory" curve, and was made the day of discharge of the patient. Free HCl 52 degrees in one hour. A gradual ascent, a slow decline, and the stomach empty in two hours.

X-ray Studies: Plates Nos. 1, 2, 3 *and* 4. (Case No. 1.)

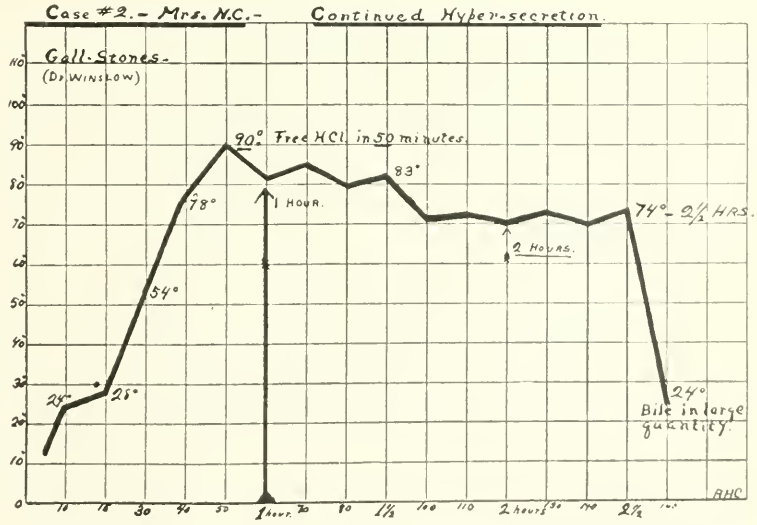
First.—These plates demonstrate definitely that there is obstruction, which must be from mechanical causes, although "spasm" may play a complicating part.

One and one-half ounces of bismuth subcarbonate given at 9 P. M. and again at 9 A. M., immediately before Plate No. 1 was taken. The second plate was taken at 10.30, the third at 12 M. and the fourth at 5 P. M.

Note in No. 1 the rapid passage of bismuth through the pylorus and the drawing of the stomach to the right, with a prepyloric bulging. In No. 2 the narrowing of the gastric lumen and the bulged irregular "cap." In No. 3 the cap is regular in outline.

Case No. 2.—Mrs. N. C.; age 24; white; married; American.

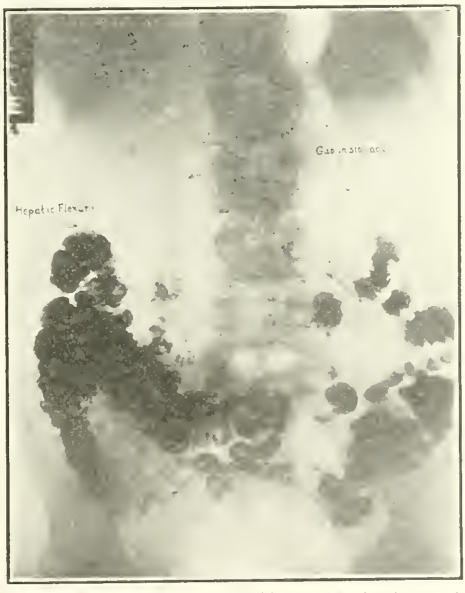
This patient was an immensely stout young woman, with a past history which shed no light whatever on her present trouble, which consisted of almost incessant vomiting and pain in the epigastrium, and also in the entire region of the transverse colon, lasting for the past three weeks.



Gall-Stone Case No. 1. (Plate No. 1.) Note the stomach drawn to the right, with prepyloric bulging. A long "hooked stomach," and bismuth from previous 12-hour meal in the ascending colon.

Gall-Stone Case No. 1. (Plate No. 2.) Taken after 1½ hours. There is vigorous gastric tonicity, with a more regularly outlined "cap," which is greatly distended. Bismuth has rapidly filled the small intestine, which appears to be blocked, distal to the jejunum.

Gall-Stone Case No. 1. (Plate No. 3.) The "cap" is more symmetrical, but greatly dilated. Some bismuth has passed beyond the obstruction, and is progressing towards the cecum, after 2½ hours. Small intestine dilated, no progress of large bowel content beyond the hepatic flexure.



Gall-Stone Case No. 1. (Plate No. 4.) In 7½ hours the bismuth has passed the obstructions, and has reached the cecum, but some is seen to be in the last part of the ileum. Stomach is completely empty. Some progress of large bowel content. Diagnosis: Obstructive adhesions probably secondary to gall-bladder involvement.

It was thought that we might be dealing with "vomiting of pregnancy," notwithstanding her stout denials. She said she had had similar attacks, although less severe, off and on for five or more years; that she had had indigestion since she was 14 years old, with eructations and "heart-burn" when in her 'teens. (X-ray and palpation were out of the question because of the adiposity.) Otherwise she had been a well woman.

Nothing was learned from a physical examination, or from the urine, blood or stools. Her case was very confusing, with little to pin a diagnosis on. A fractional examination which I made after securing a very acid residue from the fasting stomach demonstrated the "continued hyperchlorhydria," which was altered only when bile in large quantity entered the stomach, at the end of 2 hours and 40 minutes. (Case 2, Curve No. 1.) In this bile-laden gastric contents pus and red blood flecks were found upon microscopic examination. The flecks were granular under the microscope, and contained bile pigment.

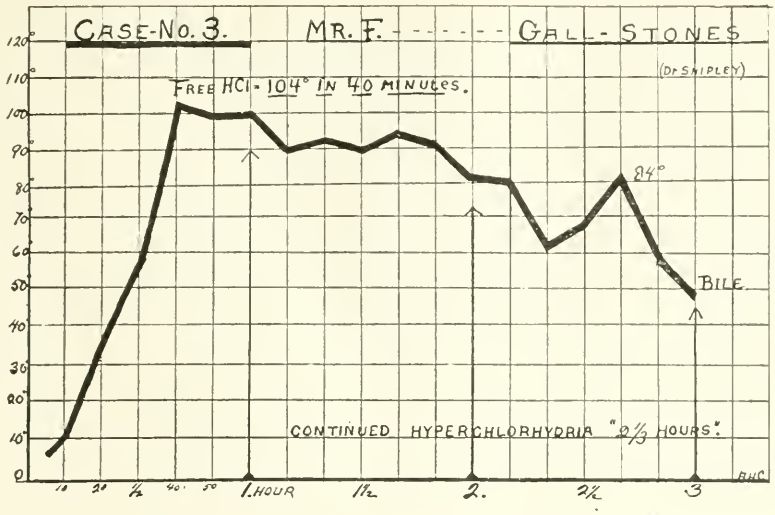
Dr. Randolph Winslow, who referred the case to me for study, verified the diagnosis at operation. The gall-bladder was adherent, thickened and contained stones of irregular shapes and sizes. It bled very readily and was much congested.

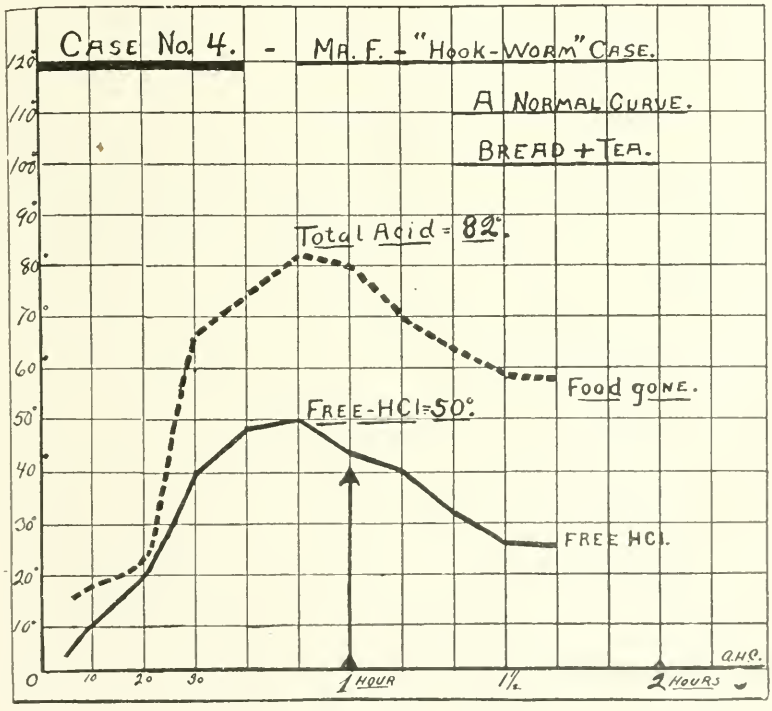
Case No. 3.—Mr. F.; senior medical student; age 24.

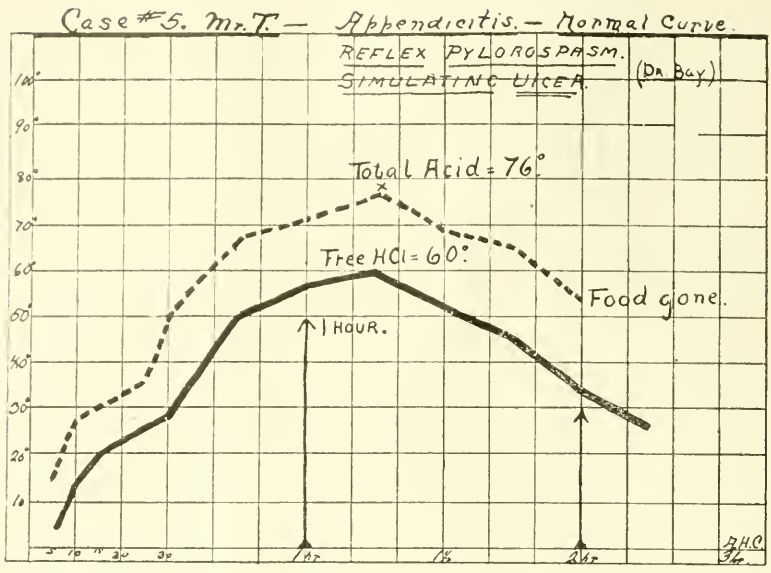
Complaint: Attacks of pain in the epigastrium and in the abdomen. (Not in the region of the gall-bladder.) These he described as "green-apple pains or cramps." He would vomit with the attacks with some relief. The attacks had become more severe the past few years, but he had experienced "indigestion" and milder attacks for eight years. The pain attacks would come on at times early in the morning, and were helped by food, but would soon return. He experienced the pains three to five hours after eating. He thought he had a duodenal ulcer. Some of his symptoms were those of a mild obstruction, and as I discovered a most extreme degree of visceroptosis, it appeared that this may have been the case, and was due to a "kinking" of the small gut. At fluoroscopy I found that there was a hyperperistalsis of the stomach and intestine, but no evidence of mechanical obstruction. Treatment directed to the visceroptosis and its relief —belts, elevated foot of bed, diet, etc.—did not aid in the least.

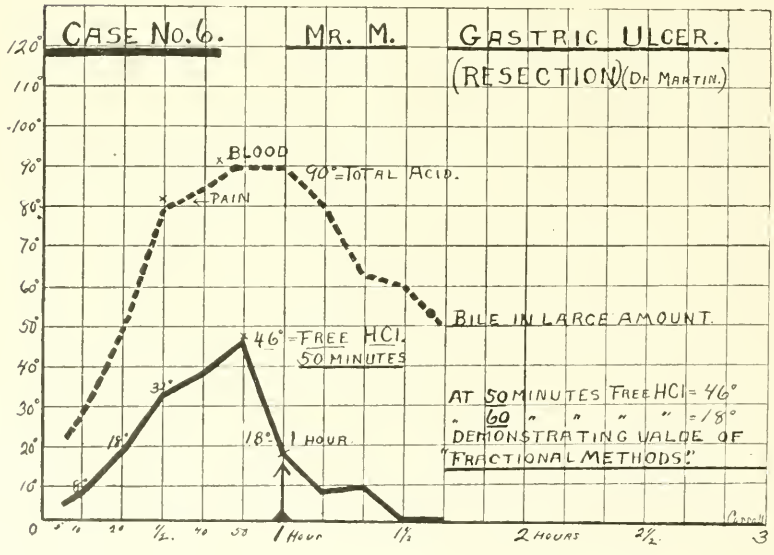
A fractional gastric analysis was decided upon, and again there is seen in Case No. 3, Curve No. 1, a marked hyperchlorhydria, with a long-continued secretion. The curve is strikingly similar to those made in cases Nos. 1 and 2. Again blood flecks were secured, but only in large numbers when the duodenum had been entered by the bulb and the gall-bladder massaged or firmly pressed upon to aid in emptying it.

Dr. Arthur M. Shipley removed the bladder and the contained stones. The patient has gained in weight, has a splendid color and is in good shape all around. His visceroptosis does not appear to interfere with his general health.


CASE-No. 3. MR. F. - - - - - - GALL-STONES
(DR SNIPLEY)
FREE HCl - 104° IN 40 MINUTES.
84°
BILE.
CONTINUED HYPERCHLORHYDRIA "2½ HOURS".
120°
110°
100°
90°
80°
70°
60°
50°
40°
30°
20°
10°
0
10 20 ½ 40 50 1 HOUR 1½ 2. 2½ 3
BHC


CASE No. 4. - MR. F. - "Hook-Worm" CASE.
A NORMAL CURVE.
BREAD + TEA.
Total Acid = 82°.
Food gone.
FREE-HCl=50°.
FREE HCl.
120°
110°
100°
90°
80°
70°
60°
50°
40°
30°
20°
10°
0
10 20 30 1 HOUR 1½ 2 HOURS
A.H.S.


Case #5. Mr. T. — Appendicitis. — Normal Curve.
REFLEX PYLOROSPASM.
SIMULATING ULCER.
(Dr. Bay)
Total Acid = 76°
Free HCl = 60°
Food gone.
1 HOUR.
100°
90°
80°
70°
60°
50°
40°
30°
20°
10°
1 Hr.
2 Hrs.


CASE No. 6.
MR. M.
GASTRIC ULCER.
(RESECTION) (Dr. MARTIN.)
BLOOD
90° = TOTAL ACID.
PAIN
BILE IN LARGE AMOUNT.
46° = FREE HCl.
50 MINUTES
AT 50 MINUTES FREE HCl = 46°
" 60 " " " " = 18°
DEMONSTRATING VALUE OF
"FRACTIONAL METHODS."
18°
1 HOUR
1 Hour
2 Hours
120°
110°
100°
90°
80°
70°
60°
50°
40°
30°
20°
10°
0

Case No. 4.

This was a case of another medical student. Mr. F., who complained of eructation, heart-burn and what he called nervous indigestion. He had been treated by an eminent specialist, but was not "cured." He thought also that he might have "ulcer."

His general appearance was excellent. Red cheeks, skin good tone and of fair weight. He had always enjoyed good health up to six months before he was sent to me for a diagnosis.

The "fractional analysis" was the first laboratory step, and as will be seen in the cut of "Case No. 4, Curve No. 1," the curve of a tea and toast test-meal is perfectly normal. I told him I thought his stomach was all right, but that there was reflex trouble. The next day I found 14 living "hookworm" embryo under the first cover-slip.

Case No. 5.—Mr. T.; age 43; white; American; married; traveling salesman.

Complaint: Pains above the symphisis and a severe sense of epigastric distention about one-half to 1 hour after meals. This had been going on for four years, and dieting did not appear to help in the least. He was much worried because of continued loss of weight, and thought he had cancer of the stomach. He has three brothers who are doctors, and he is a man of good common sense. His general appearance suggested early malignancy. There was practically no epigastric pain, but vomiting was rather a common thing for him. He had become accustomed to it, and was relieved by it. The usual studies shed no light.

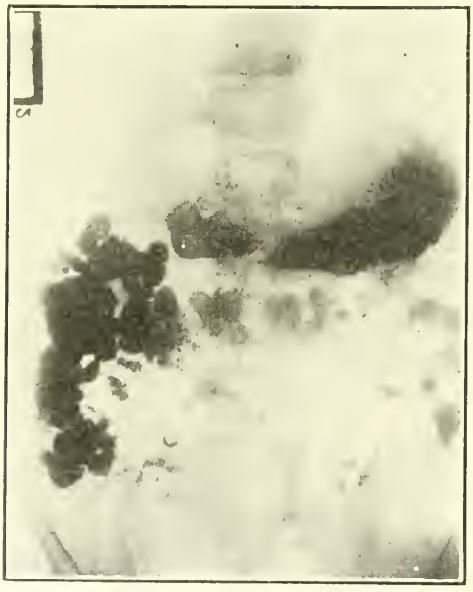
The X-ray pictures demonstrated a very irregular cap, with some seeming prepyloric filling defect and marked retention. Plates Nos. 1, 2 and 3, Case No. 5. There appeared to be an adhesive condition of the ascending to the transverse colon. Bismuth was in the stomach six hours after it was given.

The "fractional test-meal" was taken on a day when there had been no previous food for 24 hours and when there was practically no discomfort. The curve is perfectly normal. Curve No. 1, Case No. 5.

Operation by Dr. Bay disclosed a perfectly normal gall-bladder and pyloric region, but demonstrated a chronic post-cecal appendix.

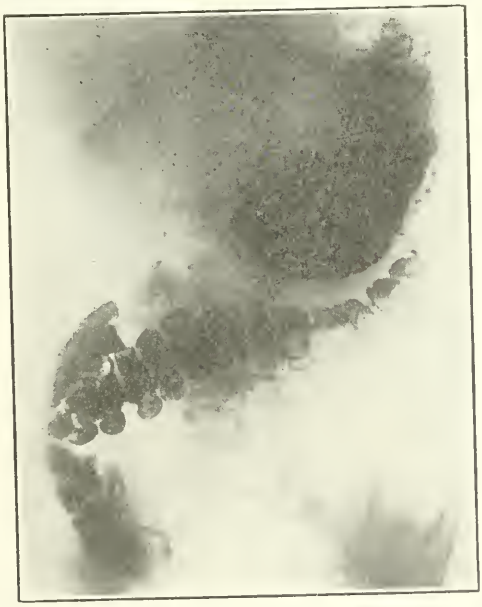
The X-ray had entirely misled. They were taken when there was a reflex spasm of the pylorus, secondary to appendiceal trouble. The fractional curve was an index to gastric activities when there was no intestinal content in the region of the appendix, and was normal. I demonstrate the X-ray plates because they show so well the "reflex spasm" of the pylorus, with retention, in some chronic appendix cases, and not to belittle this great aid in gastroenterological diagnostic work. Note the dilation due to atony in Plate No. 3, following the continued spasm of the pylorus, which in itself is secondary to the ballooning of the last portion of the ileum.

Case No. 5. (Plate No. 1.) Chronic post-cecal appendix. The fractional curve of this case was perfectly normal between attacks of "stomach trouble." No past history indicating appendicitis. Note irregular cap, also bunching at the hepatic flexure.



Case No. 5. (Plate No. 2.) Only a small amount of bismuth has passed the pylorus after 1½ hours. There is spasm of the prepyloric portion.

Case No. 5. (Plate No. 3.) Atonic dilated stomach with continued retention, six and one-half hours after last bismuth. The distal portion of the ileum dilated by previous meal. Between attacks and with an empty bowel the "fractional curve" was normal. Chronic post-cecal appendix.



Case No. 6. (Plate No. 1.) Gastric ulcer case. Stomach in good position, with previous meal at the splenic flexure. Only a small amount of bismuth has escaped into the duodenum. Prepyloric bulging and *evidence of obstruction at the pylorus.*

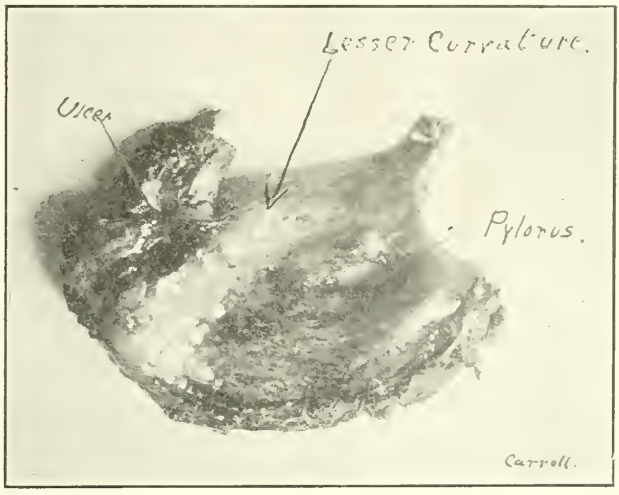
Case No. 6. (Plate No. 2.) No more bismuth has left stomach at end of 1½ hours. Pylorus apparently obstructed almost entirely. No progress in the large intestine, beyond the splenic flexure. The stomach strongly contracted.

Case No. 6. (Plate No. 3.) A six-hour plate. Stomach distended and atonic. Complete spastic pyloric obstruction. The ulcer was on the lesser curvature, nearer the cardia than the pylorus. (See "fractional curve," No. 6, also photo of resected ulcer.)

Case No. 6.—Mr. M.; single; white; American; ironworker.

This was a case of gastric ulcer, and was typical in the symptomatology. The trouble was of five years' duration, and it was thought from his loss of weight and general appearance that there was cancer, until a thorough study was made. The X-ray plates demonstrated a retention which was *almost complete.* At test-meal examination I found food which had been present 27 hours in the stomach.

He was only slightly jaundiced in appearance. However, the X-ray plates appear to demonstrate an almost complete closure at the pylorus. The impression was benign stenosis, and not reflex pylorospasm.



Case No. 6. Resection of the pyloric portion of the stomach, with "ulcer of lesser curvature" in upper left, and pylric opening to the right. Gastroenterostomy was done by Dr. Frank Martin. Uneventful recovery. Note that the X-ray plates show only a definite *pyloric* obstruction. (Plates Nos. 1, 2, 3, Case No. 6.)

Note that in the "fractional curve" (Case No. 6) that at 50 minutes the free HCl is 46 degrees; that bile returned into the stomach at 60 minutes and reduced the acid at the "one-hour period" to but 18 degrees, with a later absence of all free acid. The curve demonstrates the type of errors to be expected from the single test-meal examination and the liability of the X-ray when depended upon exclusively to deceive. Blood, but no bile at times in the content did not aid in the diagnosis, but suggested that the stenosis might be a malignant one. The pylorus appears in the X-ray plates to be the seat of the trouble, but at operation, (Dr. Martin) it was normal and the ulcer was slightly nearer the cardia, on the lesser curvature, than to the pylorus. Pyloric resection of indurated ulcer area plus gastroenterostomy. (X-ray plates Nos. 1, 2, 3, Case No. 6.) (Resected ulcer, Case 6.) Uneventful recovery.

Rehfuss has demonstrated to us that we must not expect constant results which can be used in estimating "acid content relationship" in ulcer and cancer from the single test-meal. We must start all over again to build up new statistics, and these must be based upon "fractional curves," and not upon such incomplete information as is obtained by single examinations.

It appears that, although we may not secure definite curves for each gastric disorder, that in gall-stone and in other cases where there is constant irritation there may be a continued hypersecretion.

This has been observed in six cases in all of undoubted gall-bladder trouble, but in only three has the diagnosis been confirmed at operation. In five cases of ulcer, only one of which is reported, the curve was also characteristic. In one "hookworm" case and in a chronic post-cecal appendix case the curves have been found to be normal, although the symptoms were those of gastric character only.

It is too early to draw conclusions, but the results in the limited number of cases are significant, and demonstrate, I think, that this new method has undoubted diagnostic value. This report will not have been valueless if it merely serves to stimulate a further interest in this new line of work.

The Walbert, Baltimore.

A TREATMENT FOR PRURITUS ANI.

Harvey B. Stone, M.D.

As is of course well recognized, pruritus ani is properly a symptom and not a disease. Without discussing exhaustively its etiology, pathology, etc., the cause of the distressing itching may be found in some local lesion, such as hemorrhoids, pin worms, eczema, and various other conditions, or in some constitutional disturbance, of which diabetes may be mentioned as an example. Obviously, where the cause is known, the principles of treatment will be determined by the particular nature of this cause, and it is not the purpose of this paper to discuss such cases. There remains, however, the large and most difficult group of cases in which no causative factor can be definitely discovered and which are grouped under the term idiopathic pruritus.

Various theories—acid secretions, latent infection with special types of organisms, central and peripheral nerve disturbances—have been advanced to account for the condition. No less various treatments have been employed for its alleviation. The whole gamut of ointments, powders, lotions, irrigations, etc., have been employed with varying but never general success. Cauterization, X-ray exposures and vaccines are rather more recent attempts to solve the problem. Operative measures, such as the Ball and Lynch procedures, for division of the peripheral cutaneous nerves,

have been employed. The fact that the latter have a certain field of usefulness and popularity is evidence of the extent to which the patient is willing to go to seek relief. One who has listened to the histories of such cases, with long months and years of intolerable annoyance and distress, broken rest, lost sleep and impaired health, will feel that the attempt to improve our methods of attack upon this condition is not an unworthy field of endeavor. It is the purpose of this paper to make a preliminary report of such an attempt.

The success of alcohol injections for producing local lasting anesthesia in facial and other forms of neuralgia suggested the application of the same principle for the abolition of unpleasant sensations from the anal and perianal regions. The alcohol, of course, produces its effect by destruction of the nerve fibers with which it comes in contact. Hence, in essential principle, such a treatment is quite analagous to the Ball or Lynch operations referred to above, in which the cutaneous nerves are destroyed by direct mechanical division, instead of by chemical attack. The alcohol method presents certain definite advantages that will be referred to later. There are certain possible disadvantages also that will be considered at once. Since there is no selective action of alcohol, by which motor nerves are spared, and only sensory ones injured, one might expect a loss of sphincter control if the injections were allowed to come in close relation with the motor branches to the muscles. Also, an injection of a substance causing tissue destruction, if too superficially placed, might be expected to cause a slough and resultant ulceration.

In order to test these possibilities by actual experiment, alcohol injections about the anal regions in dogs were performed, the depth of introduction being varied. Without detailing the protocols of experiments, the following facts were clearly proved: Alcohol injections will produce complete local anesthesia. If introduced deeply enough to come in contast with the motor nerves, sphincteric paralysis and resultant incontinence are produced. If introduced quite superficially—that is, within the skin itself—superficial sloughs are caused. It is quite possible, however, and not very difficult, to produce anesthesia with no sphincter paralysis nor skin ulceration; and this by introducing the needle entirely through the skin, but injecting the alcohol immediately under the skin and never deeper than that.

The method has been tried so far in only four clinical cases and for a period so far covering only a few months at most. This, therefore, can only be considered a preliminary report. The facts observed are as follows: Entire and immediate abolition of the itching from the area injected, along with other sensation leaving an anesthetic zone. No sphincter disturbance. A slight superficial slough in one case where the injection was made into the skin proper instead of under it, due to the patient pulling away just at the moment of injection. The anesthesia may last at least three months; how much longer I am not prepared to say.

As to technique, it is simplicity itself. An ordinary hypodermic needle and syringe, boiled, is filled with 70 per cent. alcohol. The skin is prepared as for ordinary hypodermic injection. The needle is introduced well through the skin in the area to be treated, and then made to travel along directly under the skin, depositing the alcohol, until the whole area has been thus infiltrated. The needle is never plunged in deeply, nor is it allowed to engage in the corium while injection is taking place. The thing is much easier to do than it sounds. The injection causes acute intense pain for a very short time, one to two minutes only. Then sensation is lost. This may be prevented by a light general anesthetic, if desired, or by preceding the alcohol injection by that of some local anesthetic. There is no subsequent treatment required.

This method accomplishes practically the same thing as the operative treatment for pruritus, and is fairly indicated in those cases of great intensity where usual measures have failed. It has certain distinct advantages over the operative procedures. It is safer; there is no undermined skin with impaired circulation, with a potential dead space under it, in an area impossible to keep clean. It is quicker. It entails no dressings, stitches or other post-operative annoyance to physician or patient, and no hospital expense. It is quite as likely to be enduringly satisfactory, and presents no greater possibilities of trouble.

The cases herein reported without detail have been done in the Johns Hopkins Dispensary since January, 1915. It is the intention to carry the work further as opportunity offers and publish a more extensive report at some later date.

Book Reviews.

A Practical Textbook of Immunity, Infection and Specific Therapy. With Special Reference to Immunologic Technic. By John A. Kolmer, M.D., Dr. P.H., Instructor in Experimental Pathology, University of Pennsylvania; Professor of Pathology and Bacteriology, Philadelphia Polyclinic, and Pathologist to the Department of Dermatologic Research; Pathologist to the Philadelphia Hospital for Contagious Diseases. With an introduction by Allen J. Smith, M.D., Sc.D., LL.D., Professor of Pathology, University of Pennsylvania. With 143 original illustrations, 43 in colors, by Edwin F. Faber, Instructor in Medical Drawing, University of Pennsylvania. Philadelphia and London: W. B. Saunders Company. Baltimore: The Medical Standard Book Co. 1915. Cloth. $6 net.

Such strides have been made in specific therapy and in our knowledge of immunity and infection that the subject has become a specialty in itself. It is the practical use to which the knowledge can be put that concerns the practicing physician. What is to be expected from specific therapy is the information desired in most

instances. The theoretical side of the subject is of only passing interest to the physician in general. The student, however, demands a fairly comprehensive manual. The book before us combines the two essentials. It contains a sufficiently fulsome account of the therapeutic technic to meet the demands of the practitioner as well as a very comprehensive elaboration of the theoretical side. There is no doubt that this character of medication is to a large extent bound to supplant drugging. In fact, such is already the case. Diphtheria antitoxin, antitetanic serum, typhoid vaccination, etc., are silent witnesses to this boon to humanity. Therefore, the physician of the future must have an intimate knowledge of immunity, and how produced. The book before us is the last word on the subject. It gives to students and practitioners a connected and concise account of our present knowledge regarding the manner in which the body may become infected, and, in turn, the method by which the organism protects itself against infection, or strives to overcome the infection if it should occur. Also to present a practical application of this knowledge to the diagnosis, prevention and treatment of disease. It also strives to give those engaged in laboratory and experimental medicine a guide to immunologic technic. To accomplish this object it concerns itself with general immunologic technic, principles of infection, principles of immunity, such as theories, various types of immunity, phagocytosis, opsonins, obsonic index, bacterial vaccines, antitoxins, ferments and antiferments, agglutinins, etc.; applied immunity in the prophylaxis, diagnosis and treatment of disease, etc. Its field is large, but the author has succeeded in making a working book. In fact, it is just the kind of a book needed by the general practitioner and student.

Nursing and Care of the Nervous and the Insane. By Charles K. Mills, M.D., Professor of Neurology in the University of Pennsylvania; Neurologist to the Philadelphia General Hospital. Third Edition. Revised by the Author, Assisted by N. S. Yawger, M.D., Instructor in Neurology to the University of Pennsylvania, Assistant Neurologist to the Philadelphia General Hospital. Philadelphia and London: J. B. Lippincott Company. Cloth, $1.25 net. 1915.

This little book contains the knowledge essential to a nurse to treat nervous and mental diseases intelligently. It is written in such plain English that a nurse of ordinary intelligence should get a good insight into the fundamental features of nervous and psychical maladies and the proper methods for nursing the various aberations. It is a very complete little volume, containing information on such subjects as massaging, various forms of electricity and their applicability, motor points, conducting cords, the nursing and care of the insane, and other information of a practical character. Besides, it is well illustrated, thus adding to its value as a disseminator of knowledge.

MARYLAND MEDICAL JOURNAL

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BALTIMORE, AUGUST, 1915

CANCER OF THE STOMACH.

CANCER of the stomach is followed by such dire results that any information which tends to clear up the question is very acceptable at this time. Cancer here, as elsewhere in the body, is apparently on the increase. Whether this increase is real or due to better diagnosis is at present impossible for us to definitely say. Whether the increase is real or apparent is of little moment; what concerns the profession is that cancer of the stomach is more prevalent than formerly. In this location the only agent which offers a possibility of cure is complete extirpation of the infected area by knife, and then only when the growth is gotten before it has metastasized. With our present facilities a cure can only be looked for while the growth is local, and, so far as we are aware, by surgery, and by no other means. As yet no authentic cure by medicine has been reported. This being so, the diagnosis must be made early, and every effort of the profession should be bent in making earlier and yet earlier diagnosis, for if the profession expects to help this class of sufferers, they must be gotten to the surgeon at the earliest possible moment. A very illuminative talk along these lines was made by Dr. Joseph C. Bloodgood at the May 10, 1915, meeting of the American Gastro-Enterological Association. He drew his conclusions from a series of 184 cases of carcinoma of the stomach, and in the above-mentioned address recorded these observations somewhat as follows: "I have gathered from the reading of the literature that those surgical clinics in which the total number of cancers of the stomach was larger than the total number of ulcers of the stomach observed a larger percentage of inoperable cancer and a smaller percentage of cures

among the cases in which resection of the stomach was possible than those clinics in which the number of ulcers of the stomach exceeded that of cancer. This is true for the cases which I have recorded. In the Surgical Pathological Laboratory to date our figures are as follows: stomach ulcer, 132; stomach carcinoma, 184. Cancer, therefore, has been more frequently observed than ulcer. The proportion of operable to inoperable cases are: No operation, 45; exploratory laparotomy, 49; gastro-enterostomy, 41; total inoperable cases, 135; operable, 49. This demonstrates that in only 26 per cent. of the cases has the cancer of the stomach been operable." Though the first cancer of the stomach was observed in 1890, it was not until 1905 that the experience of this clinic with cancer of the stomach really began. From 1905 to 1910 the total number of cases seen was 76, of which only 12, about 16 per cent., were operable. From 1910 to 1915 a distinct change has taken place. The total number of cases so far is 73, of which 28, or 39 per cent., were operable. These figures surely demonstrate that patients with cancer of the stomach are being recognized earlier. Up until 1910, among 21 resections, there have been two cures—a little less than 10 per cent. of the operable cases, or two cures among a total of 111 cases, or 1.7 per cent. Up to the present time, among the 28 resections between 1910 and 1915 there is one patient still living in whose case it will be five years since the operation in August, 1915. Dr. Bloodgood also records that the length of duration of the disease does not always influence its operability. Some of the patients evidently came to operation soon after the beginning of the growth, which was found on opening the abdomen to be inoperable, whilst other patients who did not come to operation until some time after continuous symptoms, such as loss of weight, vomiting of blood, blood in stools, etc., had occurred, upon opening were found to have a removable growth. Such, however, was an exception to the rule, the longer the presence of the neoplasms, the less likelihood of its being operable.

The experience of the Hopkins clinics pictures the experience of every other surgical clinic. If cancer of the stomach is to be mastered, the adult population must be informed that epigastric discomfort aggravated by eating solid food is a sufficient warning. They must be told that such symptoms should compel a physical examination by a competent physician. Until the public is thus educated, cancer of the stomach will continue to reap its toll.

Medical Items.

Dr. Howard A. Kelly has left for Toronto, Canada, where he will remain until September.

Dr. Francis P. Carroll, formerly of the surgical staff of St. Agnes' Hospital, has left Baltimore to take up his new work as resident physician and surgeon of the Bridgeport Hospital, Bridgeport, Conn.

Dr. John C. Hemmeter, who has been ill with appendicitis, is improving.

Dr. J. A. Campbell Colston has been promoted to senior surgeon of the Red Cross unit at Pau, France, to succeed Dr. E. Kirby Smith, who resigned to go to Serbia to aid in the work of the extermination of typhus fever.

Dr. Thomas L. Shearer, who was appointed by the British Government after the beginning of the war as examining physician of candidates, has sent a great number of ex-British service men to New York for enlistment.

Dr. William L. Smith, Riderwood, Md., who has been ill, is reported to be improving.

Dr. Thomas S. Cullen, who was operated on for gall-stones some weeks ago at the Johns Hopkins Hospital, has recovered and left for a Canadian island to fully recuperate.

One of the mast completely-equipped hospital surgeries in the country was opened to public inspection July 15 and 16, when the board of managers and Woman's Auxiliary of the Maryland General Hospital held receptions.

Dr. Clyde V. Matthews of West Preston street left recently for a western trip. He will go by way of the Grand Canyon, San Diego and San Francisco, visiting the Expositions and other points of interest. In Spokane, Wash., he will be the guest of his brother, Dr. Aldridge A. Matthews. He will return by the Canadian Pacific route.

Dr. William S. Thayer, professor of clinical medicine at the Johns Hopkins Medical School, has been nominated for one of the five vacancies of the board of overseers of Harvard University. He is one of the 10 men nominated by a postcard ballot, and stands fourth on the list.

Dr. William Lee Smith, Riderwood, Md., who has been under treatment at the Johns Hopkins Hospital, is much improved. He has left the hospital.

Dr. Thomas L. Patterson, M. A., associate professor of biology and physiology in the University of Maryland, has resigned his position in order to accept the position of assistant professor of physiology in the medical faculty of Queen's University, Kingston, Ontario, Canada.

Dr. Richard H. Johnston has resigned as clinical profesor of laryngology in the University of Maryland, and has severed his connection with the institution.

The 72d annual report of Mount Hope Retreat, near Pikesville, as submitted by Dr. Chas. G. Hill, physician-in-chief, shows that there were 661 patients there at the beginning of 1914, and that 237 were admitted during the year, making a total of 898. There were discharged 189, and 52 died, leaving 670 at the end of the year.

The patients represented seven nationalities, and were admitted from 17 States. The admissions embraced 36 occupations, and 14 had no occupations. The institution is owned and controlled by the Sisters of Charity.

As a memorial to their father, who was a member of the corporation of Yale, Dr. John Howland, Baltimore, together with his brother and sister, has given $15,000 to Yale University. The gift is to be awarded to some citizen of this country as a prize in recognition of sole achievement of marked distinction in literature or fine arts or the science of government.

Dr. Frederick A. Conradi, 2221 E. Baltimore street, for 36 years a practicing physician in East Baltimore, is seriously ill at Mercy Hospital, suffering with a complication of diseases.

Dr. Louie M. Limbaugh, University of Maryland Medical School, '14, has accepted a residency at the Union Protestant Infirmary, Jacksonville, Fla. Service will begin September 1, and is mixed.

Prof. Randolph Winslow, who has been on an extended Western trip for the past six weeks, has returned home.

Dr. David Strfett is in St. Agnes' Hospital critically ill with intestinal trouble, for which he underwent a recent operation.

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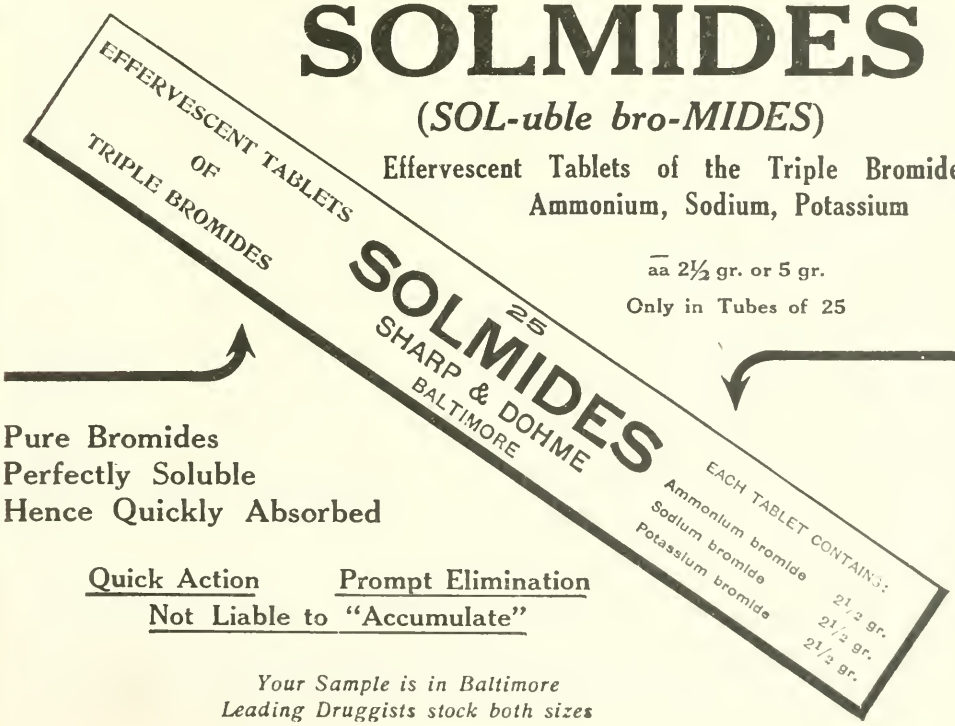

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Dr. Louis L. Lloyd, who was operated on for appendicitis June 26 in the Maryland General Hospital, is much improved.

Dr. Page Edmunds attended the twenty-fourth annual meeting of the Baltimore & Ohio Association of Railway Surgeons, of which he is president. The meeting was held in Chicago.

The decennial reunion of the class of 1905, University of Maryland, was held in Baltimore June 22, 23 and 24. One of the most interesting features of the reunion was a clinic held by Dr. Hugh H. Young at the Brady Institute.

Dr. Herbert A. Codington, ex-resident surgeon at the University Hospital, has been appointed superintendent of the James Walker Memorial Hospital, Wilmington, N. C.

Dr. Winford H. Smith, superintendent of Johns Hopkins Hospital, has been chosen head of the American Hospital Association, an organization of the country's hospital and infirmary directors. The convention will hold its 1916 meeting in Philadelphia.

BIRTHS.

Recently to Dr. Walton H. Hopkins, University of Maryland Medical School, '04, and Mrs. Hopkins, of Annapolis, Md., a son.

MARRIAGES.

Karl Miller Wilson, M.D., of 23 W. Chase street, Baltimore, Md., to Miss Mildred Hallowell Bently of Sandy Springs, Md., at Sandy Springs, June 1, 1915.

Thomas Leonard Richardson, M.D., Baltimore Medical College, '98, of Baltimore, Md., to Miss Ruby Thompson Moore of Monroe, N. C., at Charlotte, N. C., June 16, 1915.

Elliott Holsworth Hutchins, M.D., Johns Hopkins Medical School, '06, of Barstow, Md., to Miss Ernestine S. Dulaney of Baltimore, Md., at Baltimore, June 15, 1915.

DEATHS.

St. Clair Spruill, M.D., University of Maryland Medical School, '90; a Fellow of the American Medical Asociation; First Lieutenant, Medical Reserve Corps, U. S. Army; clinical professor of surgery in his alma mater; from 1892 to 1898 superintendent of the Lying-In Hospital of the University of Maryland; surgeon to the University and Hebrew hospitals; attending surgeon to the Maryland General Hospital, Baltimore, and the Emergency Hospital, Annapolis, Md.; chief surgeon to the Washington, Baltimore & Annapolis Railway and consulting surgeon to the Baltimore & Ohio System; from 1902 to 1904 major and surgeon Maryland National Guard, assigned to Fifth Infantry, died at his home in Baltimore, June 24, 1915, from septic bronchitis, following influenza, aged 49 years.

Samuel J. Windsor, M.D., College of Physicians and Surgeons, '86; a Fellow of the American Medical Association; until two years ago a practitioner of Dames Quarter, Eastern Shore, Md., died at his home in Baltimore, June 21, 1915, from heart disease, aged 52 years.

Frank Havens Russell, M.D., University of Maryland Medical School, '93; a Fellow of the American Medical Association; for several years a member of the Board of Health of Wilmington, N. C., died at his home in that city, June 4, 1915, from cerebral disease, aged 43 years.

William C. Johnson, M.D., College of Physicians and Surgeons, '87, a physician and druggist of Coleman, Fla., was shot and killed by his son, June 6, 1915, aged 52 years.

Orlando C. Stewart, M.D., University of Maryland Medical School, '78, formerly of Cookport, Pa., died at his home in Toledo, O., June 2, 1915, aged 53 years.

William Milton Dumm, M.D., Johns Hopkins Medical School, '12, assistant gynecologist at Johns Hopkins Hospital, was drowned while bathing at one of the private shores near Sparrows Point, July 12, 1915, aged 27 years.

William Gibson Floyd, M.D., University of Maryland Medical School, '78, a practitioner and druggist of Roanoke, Ala.; for several years county physician of Randolph county, died in a sanatorium in Atlanta, Ga., June 26, 1915, several days after a surgical operation, aged 63 years.

George E. Jordan, M.D., College of Physicians and Surgeons, '91, a member of the medical Society of the State of North Carolina and druggist of Gibsonville, died at his home in that place June 20, 1915, from cerebral hemorrhage, aged 56 years.

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WHAT FEDERAL LICENSURE WILL DO.

Medical Council.

The Journal of the American Medical Association for September 12, 1914, presents a long editorial in favor of Federal licensure, proposing a national standard by the way of examination for entrance into the Medical Reserve Corps, a military organization. Our own suggestion was along similar lines, but by the way of the Public Health Service, a quasi-military branch of Federal service.

There is much in common embraced in the suggestions of *The Journal* and *Medical Council*, both agreeing that Federal licensure is not prevented by the United States Constitution. But we believe our suggestion to be better because the Medical Reserve Corps is designed to serve principally in time of war, while the Public Health Service serves both during war and peace. Therefore, this article will be based upon our own suggestion, although we are very glad to see almost a parallel suggestion from this representative journal.

First, a word as to what Federal licensure would *not* do. It could not be retroactive; that is, could not give to those in practice at the time of the passage of the act the privileges it provided for new graduates, except in so far as the several States were willing, through their boards, to grant these privileges. In practice there is little doubt but that a State-board certificate based upon an examination standard at the time, and such as now constitutes a basis for reciprocity, would be accepted. But the physician who possesses legal status in a State under some old law which did not demand a rigid examination, who registered under some "sectarian" board now non-existent, or who never received a medical degree, but was permitted to continue practice in his State, could not expect to qualify under a Federal law of recent standard status unless he passed a rigid examination. The only advantage to him would be that his new license would be nation-wide instead of restricted to a State.

But *indirectly* the old practitioner might be benefited. The lack of interstate reciprocity is caused more by inferior medical schools than by any desire to keep qualified old practitioners from changing territory. It is a fact that so long as certain States tolerate low-grade colleges and register their graduates, these States will look in vain for reciprocity from better-standard States.

One of the first things Federal licensure would accomplish would be to render the low-grade medical school such an anomaly as seriously to endanger its position in the educational field. The passage of a Federal act would promptly put a quietus on the low-grade proprietary medical school. After this was accomplished there would be vastly less difficulty than at present in extending reciprocity, and the really qualified old practitioner would probably be looked after in an equitable way by an understanding between the several State boards. The probability would be that at once the several existent and disbanded medical schools would be given a rating by the Federation of State Medical Boards of the United States, certain ones being recognized and others not. Once remove the discredited medical school from legal status in *any* State and the graduates of good colleges would have little occasion to complain of their treatment by State boards. The old graduate of an inferior school who desired to move to another

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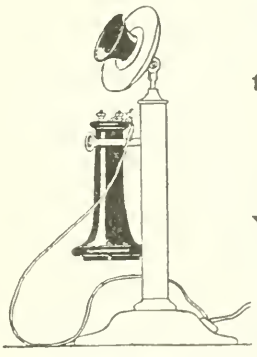

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State would have the privilege of repairing his educational defects and taking an examination, as at present; but this is about all that could be done for him.

UNIFYING THE PROFESSION.

It is unthinkable that the Federal Government would discriminate for or against any so-called sect in medicine any more than it would in religion. Federal licensure would be purely upon a basis of attainment. What the qualified man chose to call himself would be no concern of the Government. But inferior attainment, under whatever name—optometrist, chiropractic or what not—could not be acceptable. What the Government would be directly interested in knowing is: Would this man make a competent surgeon in the field in time of war? Is he capable of making a sanitary survey with the necessary chemical and bacteriological tests? Could he safely be trusted to immunize our soldiers against typhoid in time of dangerous campaigns? Could he be given charge in a campaign against malaria, yellow fever or bubonic plague? Can he diagnose tuberculosis in its incipiency, treat syphilis in the modern way, and does he have the technical ability to catherize a difficult case, make an X-ray examination, ligate a deep artery or intubate in diphtheria?

It takes but little thought to comprehend what a clearing out of fake methods would result when the pretender to medical knowledge learned that the gentle art of bamboozling legislatures and working political pulls was done for good and all.

THE OLD AND THE NEW.

Even as State banks gave way to national banks, so State licensure will give way to national credentials. But State *banking departments* did not give way, and State medical boards need not. Indeed, the coming State board will fill an even more useful place than formerly, because it will have the time to purify medical conditions within its territory. Leaving licensure bases to legislatures pulled thither and yon by all sorts of interests has worked all but irreparable harm to medicine and has served to accentuate sectarian differences and give a quasi-legal basis to quackery. Federal licensure would do away with this. Under a Federal plan, a State that wished separately to license "neuropathy," "vasculopathy," "musculopathy," "osteopathy," "dermatopathy" or "splanchnopathy" could go right on to its heart's content; but these pathies would remain to plague the State alone and would die for lack of worlds to conquer.

On the other hand, the man who believes that osteopathic manipulations are of value—as they often are in properly selected cases—could practice osteopathy under a Federal license with no restriction other than the qualifications demanded for the practice of aphthalmology or dermatorogy. Indeed, osteopathy on its merits would come more quickly into its own than under present regulations—the coming osteopaths (probably not so named) would be scientific and qualified men recognized as broad-minded specialists.

A NATIONAL DEPARTMENT OF HEALTH.

For some years the American Medical Association has been fostering the proposition, "A Doctor in the Cabinet." The movement at first was upon a basis not at all calculated to win the support of the various Federal medical services. The difficulty was

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that the various health units in Federal work were to be placed under civil, not military, control. This could never be made to work and would inject a regretable political factor into a branch of work staggering under altogether too great a load of politics, in some localities, at present. Gradually the viewpoint of the gentlemen who are sponsors of the movement are being brought into accord with the attitude of official Washington. This editorial is being written in Washington, and this editor is in position to know what the attitudes of many of the various medical officials in Washington are. We are not their spokesman and do not feel justified in quoting any of them specifically, especially since there is more or less disagreement among them. Suffice it to say that the movement in general is gaining in strength and is being brought into accord with the interests of the National Government. Briefly, the Government cannot delegate its prerogatives to any organization not definitely under governmental control and responsible to the legally constituted authorities. Any Federal department of health will be merely an enlargement of work now undertaken and as embraces interstate and international health relations. Our form of government will permit of none other.

Southern Medical Journal, September, 1914, contained an editorial suggesting an enlargement of the sphere of the United States Public Health Service, its correlation with the Medical Corps of the United States Army and Navy, the training of soldiers, marines and sailors as sanitary inspectors, and the appointment of Surgeon-General Gorgas as Secretary of Health. It is rather remarkable that the *Journal A. M. A.*, *Southern Medical Journal* and *Medical Council* should, independently of each other and in the same month, come so close together in expression of opinion, differing only in details.

We largely agree with both of these journals and have had a frank talk over the several points of view with gentlemen identified with the branches of the Federal services involved. And the point stands out that it is the *local unit* in sanitation that is weak in this country. It would be easy to organize the Federal department proposed, along one of several lines, but the *important* thing is so to organize it that it would most strengthen the local units all over the country. To do so by federally paid local officials all over the country would not only interfere with state rights, but would cost so much it could not be done.

To our great gratification, some of the gentlemen in Washington very much approve of the editorial we printed in September, and they consider the plan to be workable, except that the sanitary inspectors appointed would better not be non-commissioned, as we suggested, but be appointed as "medical officers" acting as sanitary inspectors. *But the important thing is that these men would be the local representatives of the Federal Department of Health,* were it created. This might mean *you,* Doctor, and your brethren in your medical society.

So the plan for Federal medical licensure that we proposed in September would not only provide for more equitable licensure, but it would make possible a perfectly legal and relatively inexpensive multitude of sanitary inspectors for the proposed Federal Department of Health. This would be a better force than lay sailors, soldiers and marines, and it would keep professional work

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and professional pay within the medical profession itself and raise no problems regarding Federal intrusion into State work.

AN UPLIFT OF THE PROFESSION.

The adoption of some plan along the general lines that we propose would do these things also:

It would federalize medicine, a thing much needed in America.

It would strengthen our medical societies, making of them clearing-houses for information, plans and co-operative work.

It would solve the difficult problem how to make the rank and file of physicians practically interested in public hygiene and sanitation in general, not merely as involves the individual patient.

It would put the medical profession in a strong position before the public.

It would strengthen our State health boards and departments, making friendly co-operation between them and the private physician all but universal.

It would do more to abolish quackery than any other one thing.

It would promote research along practical field lines.

It would rehabilitate the *general practice* of medicine.

It would elevate medical standards.

It would all but eliminate politics from medical practice and from our work in public sanitation.

It would cost the Government little and yet would improve the financial status of the profession at large, and it would make correct medical ethics pay.

Greatest of all, it would bring incalculable benefits to the people.

ANESTHESIA AMONG THE INDIANS.

By J. M. G. Keekay, M. D.

The anterior history on ancient anesthetic agents and methods is, with some difference, similar to the works of other authors and writers on this topic; but the following research of the "Anesthesia among the Indians" is original of Dr. J. M. G. Kukay, as will be shown in this course.

It is very difficult to write on any subject of remote times without a manuscript or some other information to give some light on the writer's investigation, excepting mummies, trephined skulls If it is not possible to know the date and name of the first that discovered the anesthesia in the civilized Europe, is it possible to know this in the savage region of America prior to Columbian time? The following brief history is the way taken by the writer in his research:

In the year 1904 (I have a few pages of this work, and anything in regard of this subject was a point of investigation and study for me), when visiting our "American Museum of Natural History" of New York, my attention was called to the collection of Indian mummies buried with a sack of coca leaves, and the trephined skulls, brought by Mr. E. G. Squier from the burials of the Incas Indians at Chiara Valley, Peru.

My first step in this research was a visit to Peru, which I did one year after. Once in the Valley of Yucay, I began to ask the

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natives if they knew the use of coca among the Indians, but no one knew nothing about it. Finally I got the address of an Indian's descendant by name Senor Juan, who lived several miles away, and I went to his camp, accompanied by a native. Senor Juan was about 90 years of age (he don't know it). After I told him the object of my visit (the writer is familiar with the Spanish language), he said: "We don't use books or any writing, but we keep all the records in the 'Quipu,' in which the color of the cord, length, number of knots and kind of it, etc., we record the important incidents, and by memory the non-important ones." "Can you tell me what for your forefathers were buried with coca leaves?" I asked. "Certainly," he answered. "Before the Spaniards came we were more happy and rich, and when a 'Cacique' (Indian chief) or some member of his family died, the relatives put, with many other things, the holly leaves." "What other use have they for these leaves?" "Oh, many," he said. "We use it even today as a tonic, to relieve pain, and chew it as you do with tobacco." "Can you explain the reason of the perforation of the skull?" "Of course," he answered..

"This was done to the son or son-in-law of the dead 'Cacique,' and was a religious ceremony. If the son lived after the operation, he became cacique, but the most died after cutting the square hole in his head." "Do they use any coca leaves in the operation?" I asked. "Yes, plenty. "The 'Curanderos' (Indian physicians) mixed in one concave stone a large quantity of leaves and water, and with other stone, like a pestle, triturated them very fine to the consistence of a syrup. Then they gave slowly to drink until they do not move, and the curanderos start the operation, which takes sometimes the whole day; and all the time during the operation the men, women and children pray with his prayer sticks."

"What do they do in case that the man feels pain?" "Well, they give more stuff to drink."

"Did they ever die before the operation was over on account of the syrup?" Very few. The curanderos have very much experience in handling the coca, and they know the danger by the color of the skin."

"Have you seen any such operations?" I asked. "No;" they were used when the Incas domained this country, or in times when no Christian inhabited here." "How do you know all the customs among your people?" "Easy; some by memory from my fathers, grandfathers, etc., and others by old 'Quipus.'"

After all this caudal of information the writer went to Surco, Peru. In this place he compiled more information on the use of coca leaves. Between the different uses was that they gave to eat coca leaves to the Indian women in labor time. But nobody gave so complete and important information as Senor Juan.

By this revelation and the evidence from the museum the writer was completely convinced that coca leaves were used to produce narcosis and anesthesia by the Incas Indians of Peru in performing surgical operations by means of knives made from copper, bronze and stone.

No one that knows the works of Dr. von Tschudi, Mr. E. G. Squier and the writer's research will doubt this statement.

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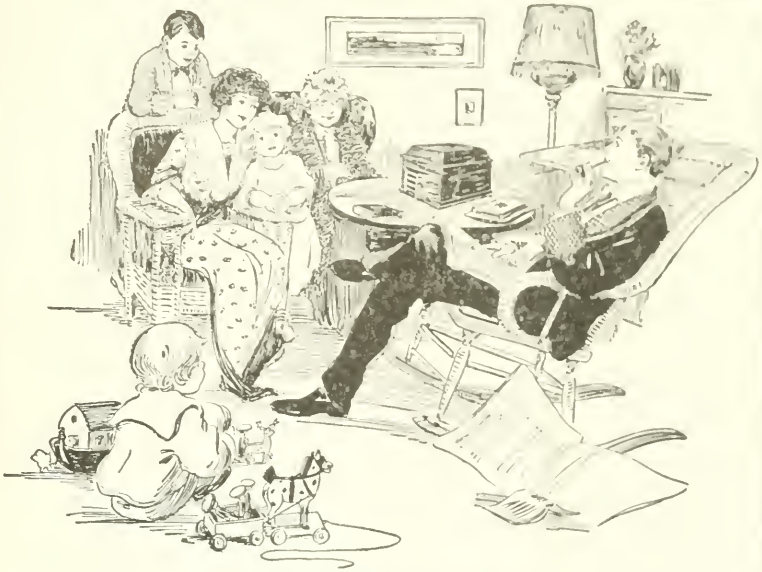

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The most recent fraud practiced in regard to this product is an attempt to profit by the renown of the firm of Sander & Sons. In order to foist upon the unwary a crude oil, that had proved injurious upon application, the firm name of Sander & Sons is illicitly appropriated, the make-up of their goods imitated, and finally the medical reports commenting on the merits of their excellent preparation are made use of to give the desired luster to the intended deceit.

This fraud, which was exposed at an action tried before the Supreme Court of Victoria at Melbourne, and others reported before in the medical literature, show that every physician should see that his patient gets exactly what he prescribed. No "just as good" allowed.

More Light on Ipecac Medication.

THE discovery that the alkaloids of ipecac possess marked amebicidal properties and are curative in two very prevalent diseases, namely, pyorrhea alveolaris and amebic dysentery, caused a greatly-increased demand for the drug and a consequent doubling, and even trebling, of the price. Previous to this discovery ipecac was used in a moderate way by physicians for the most part as syrup of ipecac or as Dover's powders.

It has been shown that cephaeline, one of the ipecac alkaloids, possesses twice the emetic strength of the other alkaloid, emetine, and that this latter principle is stronger than cephaeline as an amebicide. As a result of this syrup of cephaeline, a new pharmaceutical product has been placed on the market by Eli Lilly & Co. of Indianapolis, and is said to be replacing the old syrup of ipecac, which was decidedly nasty tasting and disagreeable for children to take.

The other alkaloid of ipecac, emetine, is now used almost entirely for subcutaneous injection, and is supplied for this purpose either in tablets or in sterile solution in ampoules. Eli Lilly & Co. are authority for the statement that the greatest demand for this product comes from dentists, who seem to prefer the ½ per cent. solution in 2 c. c. ampoules, this solution being

used locally in the pyorrheal pockets about the teeth.

Perhaps the greatest field for ipecac and one in which both physicians and dentists are greatly interested is the internal administration of ipecac for its systemic effects in treating pyorrhea and amebic dysentery. The oral administration of the drug is made possible by a form of hydrated aluminum silicate combined with the ipecac alkaloids in the form of an absorption compound. The alkaloids are liberated only in the alkaline intestinal secretions, and thus all nausea is avoided.

These tablets are manufactured by Eli Lilly & Co., and they represent the most practical and successful method of giving ipecac orally. This treatment will be preferred by patients to the painful procedure of hypodermatic injection, and the tablets will be found far more convenient for the busy physician and equally as certain in their therapeutic results. Literature will be supplied on request to Eli Lilly & Co.

The Delicate School Girl.

EVEN the most robust and generally healthy children show the deleterious results of the modern system of educational "forcing" that prevails in most of our larger cities. The child that starts the school year in excellent physical condition, after the freedom and fresh air of the summer vacation, in many instances becomes nervous, fidgety and more or less anemic as the term progresses, as the combined result of mental strain and physical confinement in overheated, poorly ventilated schoolrooms. How much more likely is such a result in the case of the delicate, high-strung, sensitively-organized adolescent girl? It is certainly a great mistake to allow such a girl to continue under high mental pressure at the expense of her physical health and well-being, and every available means should be resorted to to conserve the vitality and prevent a nervous breakdown. Regularity of meals, plenty of sleep, out-of-door exercise without fatigue, open windows at night and plenty of nutritious food should all be supplied. Just as soon as an anemic pallor is noticeable it is a good plan to order Pepto-Mangan (Gude) for a week or two, or as long as necessary to bring about an improvement in the blood state and a restoration of color to the skin and visible mucous membranes. This efficient hematinic is especially serviceable in such cases, because it does not in the least interfere with the digestion nor induce a constipated habit.

War Prices.

THE enormous advance in the price of drugs, owing to the European war, is well exemplified in the bromide salts. Bromide of Potassium, for instance, which sold before the war at 35 cents a pound, is now quoted at $1.25 per pound, and the other salts have advanced in proportion. The very high price and scarcity of these salts is a great temptation for substitution. The safe way for the physician is to prescribe Peacock's Bromides, which, in spite of the great advance in the cost of manufacture, is still sold at the old price. Its formula has not been changed and this is a guarantee of uniformity and purity.

Chronic Catarrhal Diseases.

CHRONIC catarrh never fails to indicate general constitutional debility. Local treatment is always desirable but for permanent results efforts must be directed toward promoting general functional activity throughout the body, and a general increase of systemic vitality. The notable capacity of Gray's Glycerine Tonic Comp. in this direction readily accounts for the gratifying results that can be accomplished through its use in the treatment of all chronic catarrhal affections, but especially those of the gastro-intestinal canal and respiratory tract. The particularly gratifying features in the results accomplished by Gray's Glycerine Tonic Comp. are their substantial and permanent character. This is naturally to be expected since they are brought about through restoring the physiologic balance of the whole organism.

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Milton Academy was founded at Philopolis, Baltimore county, in 1847, and later moved to Baltimore, and has been a teaching school ever since, and is doubtless the oldest private school in Baltimore.

In 1902 the Night School was organized, and this department has been in continuous session three nights per week ever since, and has been the means of giving the foundation for many men and women who are now successfully engaged in the practice of law, medicine, dentistry, pharmacy, the ministry, etc., while many others

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have entered and successfully completed their college or technical education.

In 1906 college work in chemistry was inaugurated, and later the College of Pharmacy and Chemistry incorporated. In this school the demands are as high as in any school in the land, as it requires four years to win the degree of Doctor of Pharmacy at Milton. Graduates of this department are successfully practicing their profession in Baltimore and Maryland, as well as in other States, and in the West India Islands, in the Philippines and in European countries whose training was received in the resident classes.

Under the direction of Dr. Robert D. Williams, a graduate of Princeton and Chicago Universities, and for several years a student at the Hopkins, work of a college grade will be offered beginning with the fall classes.

In addition to the work in high school and college courses, instruction is also offered in business subjects and civil service preparation. The aim of Milton is "service;" the object to "help others to help themselves."

At Milton the man who has missed his opportunity and must now earn his living can "learn while he earns" in the Night School, and many are now doing it.

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SOLMIDES are recommended in all conditions where the bromides are indicated, including epilepsy, nervous excitation, hysteria, infantile convulsions, tetanus, strychnine poisoning, neuralgia, delirium tremens, nymphomania, nervous dysmenorrhea, etc.

They dissolve quickly and should be administered during effervescence. Being perfectly soluble, they are quickly absorbed and are also eliminated more quickly; hence there is less likelihood of "Bromism." The unpleasant taste of bromides has been overcome, and Solmides can therefore be administered to patients who are not able to take or retain other preparations of these salts.

A Valuable Mechanical Laxative.

IN view of the many varieties of liquid petrolatum with which the drug market abounds, and the questionable quality that distinguishes much of it, physicians will welcome the announcement that Parke, Davis & Co. are supplying a product, under the designation of American Oil, that bears a substantial guaranty of purity and efficiency.

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American Oil is not a purgative. Neither is it a laxative in the general sense of stimulating the bowel by local irritation. Its function is that of an intestinal lubricant. It passes in toto through the alimentary tract, not a particle of it being digested or absorbed. It mingles with the food in the stomach and upper intestinal tract, with the result that the feces become thoroughly lubricated and pass through the lower bowel more rapidly than they otherwise would, and are expelled from the colon more promptly and with greater ease. Not the least valuable feature of this liquid petrolatum is its protective effect on the stomach and intestine, it being

well known that abrasions or irritations of the mucous surfaces permit bacterial infection and general toxemia.

American Oil may be taken with a pinch of salt or a dash of lemon juice if the patient so desires, or it may be floated on a glass of water, wine, milk or other beverage. The dose recommended for adults is one or two tablespoonfuls morning and night, before or after meals, for the first two or three days. Later the amount may be diminished. To insure against possible mistakes, physicians will do well to specify "P., D. & Co." on their prescriptions.

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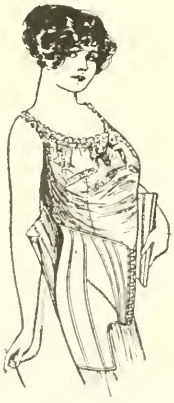

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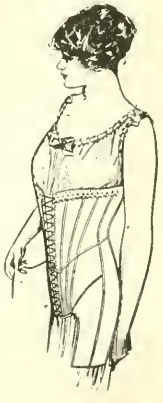

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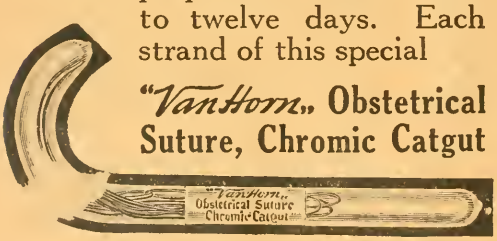

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